

# 9<sup>th</sup> Conference on Air Quality Modeling – A&WMA AB3 Comments on Use of Gridded Meteorological Data

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(AB-3) Committee*

# Comment Areas

- Use of existing tools
- Two step evaluation process
- Evaluation variables
- Sensitivity to prognostic model options
- Metric for evaluating success



# Use of Existing Tools

- Common theme of limited resources
- Make maximum use of existing tools?
  - CALMM5, CALWRF, CALRUC, CALETA, CALRAMS
  - Converts data to common file formats (3D.DAT, 2D.DAT) for all prognostic models
  - Retains wind data unchanged from prognostic model, interpolates scalars to wind grid point location
- Wind rose software
  - Annual, seasonal, diurnal wind roses
- Meteorological evaluation software
  - Quantitative statistical measures



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# Two Step Evaluation Process

- Step 1: Evaluate gridded meteorological data performance separately from dispersion model performance
  - There will likely be a large sensitivity of dispersion model to met database
  - Separately determine best available dataset for each parameter
  - Sensitivity of prognostic model parameters
  - Use of NCEP products (e.g., RUC fields)
  - Sensitivity of dispersion model to different variables
    - Model parameterizations and grid resolution
- Step 2: Evaluate dispersion model performance with gridded dataset vs. obs met data

# Evaluation Variables

- Determine available observational datasets
- Evaluate all meteorological variables
  - Wind speed, wind direction
    - Frequency of light wind speeds, etc.
    - Vertical wind and temperature structure
  - Temperature & relative humidity
  - Micrometeorological parameters
  - Solar radiation
  - Cloud cover and ceiling height
  - Precipitation
- Allow for potential use of sub-hourly prognostic data



# Metrics to Evaluate Success

- How best to determine what dispersion model results are good enough?
  - Consistency with results using observational data?
  - No under-prediction bias relative to observed met results?
  - Evaluate results under many different types of conditions
    - Coastal
    - Flat rolling terrain
    - Mountainous
  - Tracer or other observational datasets? \*\*



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